Division of Environmental Design	Research field	Hydraulic Engineering	Lab. ID
			ED03
Laboratory web site	http://hyd-eng.w3.kanazawa-u.ac.jp/		
Research subjects			

1. Long-term and large scale morphological change in coastal areas (M. YUHI)

The ongoing research projects include the following topics: inter-annual systematic migration of multiple sandbars, human-induced erosion of river-coastal watersheds, development of low-cost monitoring system using image processing, numerical modeling of waves, currents, and sediment transport in nearshore areas. Besides, numerical simulations for tsunami propagation and run-up have been conducted.

2. Fluid-sediment-bed interactions for coastal and river structures (S. UMEDA)

Toward understanding of the physical processes of interactions between wave, current, sediment bed around structures in coast and river, we have been studied the following subjects: initiation of sediment motion under waves, modeling of vortex ripple morphodynamics, scour and recovery process around structures, bed evolution in river and estuary. The collaborative investigation on coastal defense structures has been carried out to clarify the mitigation effects of wave barriers on inundation and forces induced by tsunami and waves.

3. Effects of climate change on watercycle, data assimilation and ensemble numerical weather prediction (K. TANIGUCHI)

For future river planning, we are investigating future variations in water cycle with global warming projections and numerical weather prediction model, distributed hydrological model, and inundation simulation model. Based on these simulations, flood risks (economic losses, evacuation difficulties) are evaluated. At the same time, for improviment of precipitation prediction by numerical model, we are developing a data assimilation technique.

4. Improvement of Air-Sea-Wave coupled model and assessment of climate change on coastal disaster (J. NINOMIYA)

Our research topics: Field observation of air-sea-wave, Development of bulk model for air-sea interaction, Improvement of numerical models, Analysis of coastal disaster, Future change of coastal hazards and environment of sea-wave.

Master/Doctor course: Education policy, curriculum, typical activity in the laboratory

All of the graduate students join the weekly seminar of the research group of their supervisors. The graduate students present and discuss their research progress, related literature and textbooks in the seminar with other members. In addition, one to one meeting with their supervisor is conducted on the regular basis. The students also attend the monthly research seminar for the whole laboratory and other institutes.

The graduate students are required to present their research at related international conferences. At the end of the 1st year of the master course, pre-defense is held; All the faculty members evaluate the research progress and provide various advise on future research plan. Doctor course students are also required to publish their research outcomes in peer-reviewed academic journals. For foreign students, all the activities above can be done in English.

Daily life in the laboratory, etc.

There are four staff members and about 30 students in our lab. Each staff member works on his/her own research themes, but members in other groups go field survey or make experiments together. Students can discuss all staff members and obtain knowledges from wide diciplines.

We have several parties with all members in a year, and you can make friends with senior and junior student, foreign students, and sometimes you can also find diffrent aspects of professors.

Message or comments by the laboratory faculty staffs

The specialty of our lab's faculty staffs is meteorology, river, coast and ocean engineering concerned with hydrosphere and hydrologic circulation, so students are possible to discuss actively with each expert under very free feeling. Enjoy campus life with our faculty staffs and master course students. After graduation of master course, the rate of employment is 100%, and graduates are active as a public servant, an engineer of construction company and construction consultant. Many working doctor course students are also active.

Recent Mast	Recent Master theses in these 3 years (+ more if appropriate)			
year.month	Thesis title (including English translation of Japanese thesis title)			
2021.3	Inter-comparison of computation methods for nonlinear four-wave interactions			
2021.3	Evaluation of flood economic loss by considering depopulation and variations of urban structure			
2021.3	Influence of the properties of submarine landslides on initial tsunami profiles			
2021.3	Analysis of Oceanic Future Projection Data around Oyashio Current			
2021.3	Extension of the applicability of integrated formula of wave overtopping and runup modeling			
2020.3	Estimating Characteristics of Levee-Breach and Inundation process by Hydrodynamic Model Considering Grain Size Distribution of Riverbed and Levee Materials			
2020.3	Reconstruction of 2-Dimensional Ensemble Rainfall Forecast by the Application of Particle Filter Technique			
2020.3	Fundamental study on cyclic migration of multiple bars and related characteristics of sediment transport			
2020.3	Neural Network to Predict Yorimawari Wave and Long-Term Projection of Waves			
2020.3	Fundamental study on molphological changes in multiple-bar coast and related characteristics of wave transformation			
2020.3	Characteristics of Morphological Change in Breaker Zone and Offshore Zone in Ishikawa Coast			
2020.3	Characteristics of Longshore Distribution of Nearshore Current and Wave-Runup in North Kaetsu Coast			
2020.3	Risk Evaluation of Flood Disaster based on Inundation Simulation by Considering Simultaneous Dike Breaking in Multiple Rivers			
2019.3	A fundamental study on surfzone monitoring using a small unmanned aerial vechile			
2019.3	Future change of coastal disaster caused by explosive cyclone using large ensemble climate prediction data.			
2019.3	A study on morphological change around the mouth of Tedori River due to flood and waves			
2019.3	A fundamental study on long-term variations of wave climate at Ishikawa Coast. Japan			
2019.3	Thermal environment analysis of the Sea of Japan using long-term ocean reanalysis data			
2019.3	A basic study on flow characteristics of coastal currents along Kaestu Coast Japan			
2010.3	A fundamental study on tsunami generation by submarine landslides			
Recent Doctoral theses in these 3 years (+ more if appropriate)				
voor month Theore title (including English translation of Jananasa theore title)				
2021.3	Variations of precipitation in Hokuriku Region under the climate change and evaluation of evacuation			
2019.9	possibility during floods Numerical Simulation of Tsunami Run up around Porous Vertical Barriers based on a Finite volume Godunov type High resolution Scheme			
2019.3	Study on the influence of shape and motion of submarine landslide on tsunami generation			
2018.9	Development of Combined Downscaling Method for High-resolution Rainfall Estimation and River- Runoff and Inundation Simulation under Global Warming Condition			
2018.3	Future variations of extreme weather events and its impacts in Vietnam			
2017.3	Long -term variation of wave characteristics at the Kaetsu Coast, Japan and regional comparison of			
2015.3	5.3 Characteristics of morphological systems on the northern Kaetsu Coast Ishikawa Japan			
	Development of a well-balanced observation system of coastal morphology and an efficient method o			
2013.9	2013.9 shoreline detection using image analysis			
2013.9 Analysis on long-term bed adjustment to human impacts and bore inundation in a lower river				
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